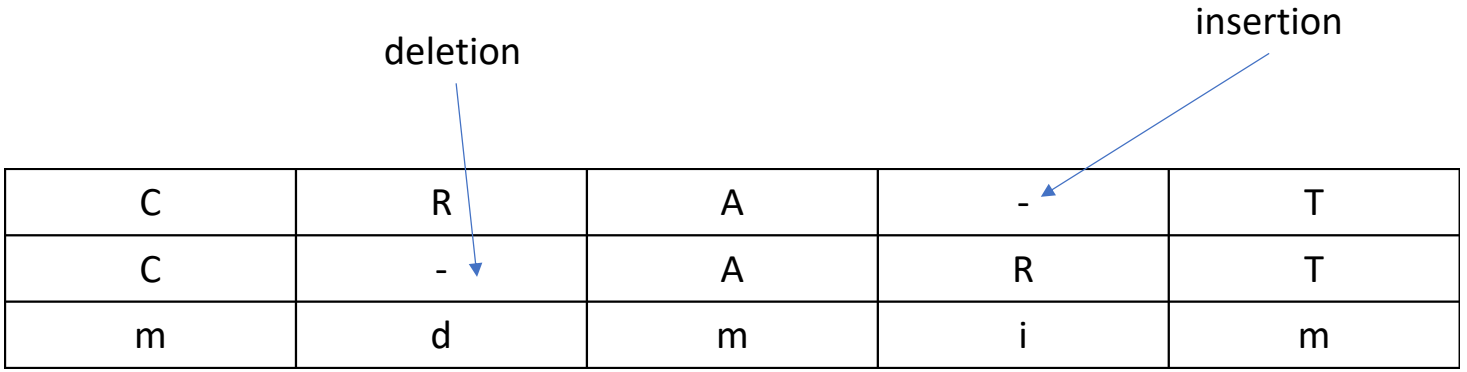
Needleman Wunsch Algorithm

Rao Kotagiri

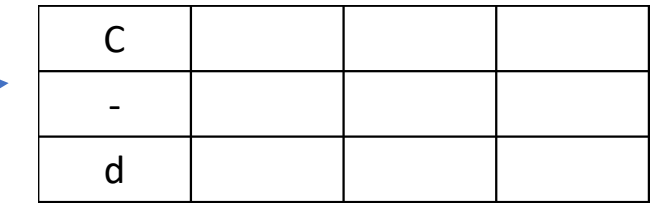
Aligning CRAT to CART



C	R	A	-	T
C	-	A	R	T
m	d	m	i	m

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1			
C					
A					
R					
T					



C			
-			
d			

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1	-2		
C					
A					
R					
T					

C	R		
-	-		
d	d		

m = 1; d = r = i = -1

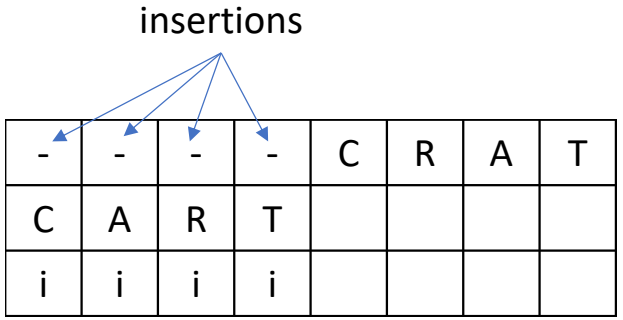
	ε	C	R	A	T
ε	0	-1	-2	-3	-4
C					
A					
R					
T					

deletions

C	R	A	T				
-	-	-	-				
d	d	d	d	C	A	R	T

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0				
C	-1				
A	-2				
R	-3				
T	-4				



m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1			
C		-2			
A					
R					
T					

C			
-			
d			

C	-		
-	C		
d	i		

m = 1; d = r = i = -1

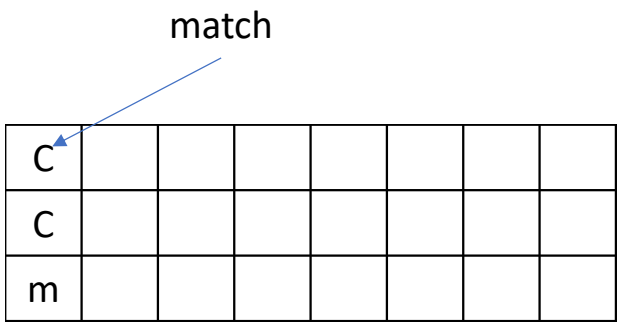
	ε	C	R	A	T
ε	0				
C	-1	-2			
A					
R					
T					

-			
C			
i			

-	C		
C	-		
i	d		

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1	-2	-3	-4
C	-1	1			
A	-2				
R	-3				
T	-4				



m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1	-2	-3	-4
C	-1	1	0		
A	-2				
R	-3				
T	-4				

match

C	R						
C	-						
m	d						

C	R						
C	-						
m	d						

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1	-2		
C			-3		
A					
R					
T					

C	R		
-	-		
d	d		

C	R	-	
-	-	C	
d	d	i	

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1			
C	-1	-2			
A			-3		
R					
T					

-	C		
C	-		
i	d		

-	C	R	
C	-	A	
i	d	r	

m = 1; d = r = i = -1

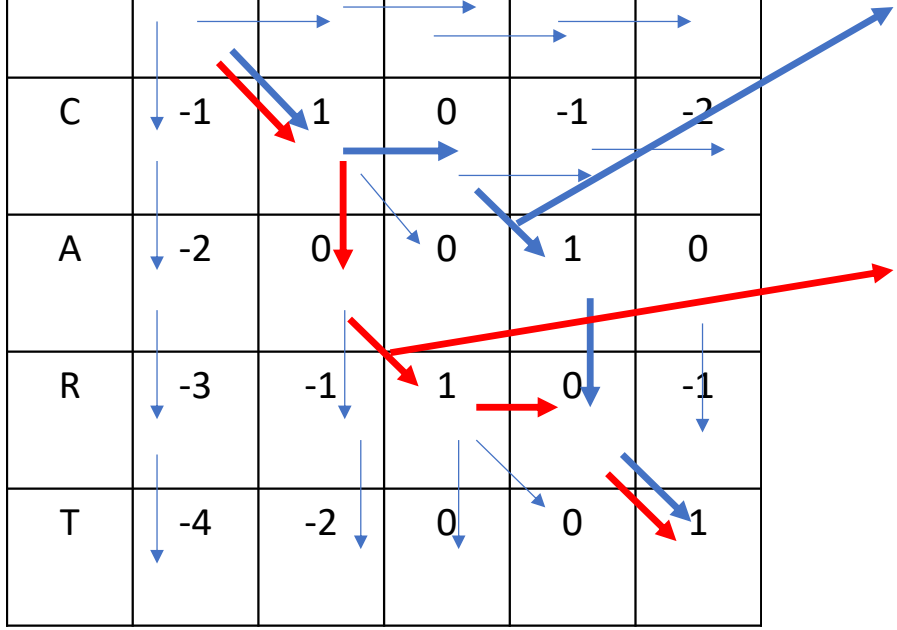
	ε	C	R	A	T
ε	0	-1			
C	-1	-2	-3		
A					
R					
T					

-	C		
C	-		
i	d		

-	C	R	
C	-	-	
i	d	d	

m = 1; d = r = i = -1

	ε	C	R	A	T
ε	0	-1	-2	-3	-4
C	-1	1	0	-1	-2
A	-2	0	0	1	0
R	-3	-1	1	0	-1
T	-4	-2	0	0	1



C	R	A	-	T
C	-	A	R	T
m	d	m	i	m

C	-	R	A	T
C	A	R	-	T
m	i	m	d	m

m = 2; d = -1; r = -3; i = -2

	ε	C	R	A	T
ε	0	-1	-2	-3	-4
C	-2	2	-1	-2	-3
A	-4	0	-1	1	0
R	-6	-2	2	1	-1
T	-8	-4	0	-1	3

C	-	R	A	T
C	A	R	-	T
m	i	m	d	m